

### **ABSTRACT OF THE DISCLOSURE**

A high voltage LDMOS transistor according to the present invention includes P-field blocks in the extended drain region of a N-well. The P-field blocks form the junction-fields in the N-well for equalizing the capacitance of parasitic capacitors between the drain region and the source region and fully deplete the drift region before breakdown occurs. A higher breakdown voltage is therefore achieved and the N-well having a higher doping density is thus allowed. The higher doping density reduces the on-resistance of the transistor. Furthermore, the portion of the N-well generated beneath the source diffusion region produces a low-impedance path for the source region, which restricts the transistor current flow in between the drain region and the source region.